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Forthcoming Papers

W. Fischer, M. Hartmann, H. Hühnermann, Fachbereich Physik der Philipps-Universität Marburg.
H. Vogg, Labor für Isotopentechnik, Kernforschungszentrum Karlsruhe:

Isotopieverschiebung der Bariumnuklide ^{140}Ba, ^{138}Ba, ^{136}Ba und ^{134}Ba in der Ba II-Resonanzlinie $6p\,^2P_{1/2}-6s\,^2S_{1/2}$ (Isotope Shift of the Barium Nuclides ^{140}Ba, ^{138}Ba, ^{136}Ba, and ^{134}Ba in the Ba II-Resonance Line $6p\,^2P_{1/2}-6s\,^2S_{1/2}$)

The radioactive barium nuclide ^{140}Ba ($T_{1/2}=12.8$ d) has been separated chemically from fission products of uranium. The scheme of the carrier-free separation is described. The isotope shift in the barium II resonance line $6p\,^2P_{1/2}\rightarrow 6s\,^2S_{1/2}$, $\lambda=4934$ Å has been measured by means of a pressure scanned Fabry-Pérot interferometer. The result $\Delta\nu$ (^{140}Ba$-^{138}$Ba)$=-39.3\,(3.2)$ mK has been used together with the remeasured isotope shift values of ^{138}Ba, ^{136}Ba, and ^{134}Ba to calculate the change of the mean square radius of the nuclear charge distribution $\delta\langle r^2\rangle$. The results are compared with data for isotonic nuclides of neighbouring elements.

Heiner Müller-Krumbhaar, Physik-Department E14 der Technischen Universität München:

Spin Pair Correlations of the Classical Heisenberg Ferromagnet Above and Below the Critical Point: Results of Self-Consistent Monte Carlo Calculations

The spin-pair correlation functions of the classical Heisenberg ferromagnet with simple cubic lattice have been calculated in the paramagnetic and ferromagnetic temperature range using the self-consistent Monte Carlo method.
The results agree with high-temperature series expansions above T_c, for low temperatures with spin-wave theory. By two different approaches the divergence of the ferromagnetic homogeneous susceptibility in zero field throughout the ferromagnetic temperature range could be verified.
The functional dependence of the static susceptibility $\chi_T(\mathbf{k})$ upon the inverse correlation length κ_1 is discussed above and below T_c and a Fourier transform for the explicit dependence of the spin correlation upon correlation length below T_c is given.
According to these results the scaling assumption $\nu=\nu'$ for the exponents of the correlation length in the critical region is consistent with a divergent ferromagnetic susceptibility.

G. Baur, Max-Planck-Institut für Kernphysik, Heidelberg, Germany,
D. Trautmann, Physics Department, University of Basel, Switzerland:

On the Theory of Stripping Reactions into the Continuum

A formulation of stripping reactions into the continuum is given taking the (d, p)-reaction as a specific example. We use the DWBA and the assumption that contributions from the nuclear interior are negligible. Under these assumptions we show that the cross section can be split into a "distortion matrix element" and a term depending on the neutron target interaction only through the phase shifts of the corresponding elastic neutron scattering. The interference with the "pure break-up" process is discussed. The connection between stripping to bound and unbound states in the limit of zero binding energy is established. A comparison with recent experimental results is given, where the "distortion matrix elements" are calculated, for the sake of simplicity, in the "Butler approximation".

H. Figger and H. Walther, I. Physikalisches Institut der Universität Köln:

Optical Resolution Beyond the Natural Linewidth: A Level-Crossing Experiment on the $3\,^2P_{3/2}$ Level of Sodium Using a Tunable Dye Laser

A level crossing experiment on the hyperfine structure of the $3\,^2P_{3/2}$ level of Na^{23} was performed using a nitrogen laser pumped dye laser for the excitation of the Na atoms. The fluorescent light was observed in time intervals which were initiated up to seven lifetimes after excitation. Therefore the signal was only determined by atoms having survived in the excited state up to the initiating time. The minimum linewidth observed was 6 times smaller than the natural width. Neighbouring crossing signals, which overlap in a level crossing experiment using time integral observation of the fluorescent light, could be resolved. The accuracy of the hyperfine constants of the $3\,^2P_{3/2}$ level could be improved.

Bernward W. Huber, and Klaus Krämer, Institut für Experimentalphysik, Ruhr-Universität Bochum:

Levels of ^{97}Tc from the Decay of ^{97}Ru

The level scheme of ^{97}Tc has been investigated by observing the γ-rays following the decay of 2.9-d ^{97}Ru. γ-singles and $\gamma\gamma$-coincidence measurements were carried out with Ge(Li)-detectors. The time difference of coincident γ-rays was measured as a third parameter. From the coincidence events, the intensities of $\gamma\gamma$-cascades were extracted. The ^{97}Ru decay gives rise to 18 γ-lines which could be fitted into a level scheme of ^{97}Tc consisting of 9 levels. Spin and parity assignments of the levels were made from $\log(ft)$ values and γ-ray branching ratios. Discrepancies concerning the energy of the first $3/2^-$ state and the existence of a 946 keV level are discussed.

Klaus Krämer and Bernward W. Huber, Institut für Experimentalphysik, Ruhr-Universität Bochum:

Levels of ^{95}Tc from the Decay of ^{95}Ru

The level scheme of ^{95}Tc has been investigated with Ge(Li)-detectors by observing the γ-rays after the decay of 1.65 h ^{95}Ru. The energies and intensities of the γ-transitions were extracted from γ-singles and $\gamma\gamma$-coincidence spectra.
In the decay of ^{95}Ru 88 γ-transitions were observed; a scheme of ^{95}Tc with 25 levels is proposed into which 86 transitions could be accomodated. Spin and parity assignments were made from $\log(ft)$ values and γ-ray branching ratios. The level structure of ^{95}Tc is compared with that of the other odd Tc isotopes.

K. H. Spatschek and P. K. Shukla, Institut für Theoretische Physik der Ruhr-Universität Bochum:

Frequency Shift and Anomalous Resistivity of Turbulent Plasmas in External Electric and Magnetic Fields

Accounting for the modified orbits of plasma particles due to constant external electric and magnetic fields, a general expression for the velocity space diffusion tensor of a turbulent plasma is derived. The nonlinear frequency shift and the anomalous resistivity in the presence of external fields are calculated. It is shown that the effect of a strong external electric field on the frequency shift is to reduce its magnitude. Furthermore, the dependence of the anomalous resistivity on the external magnetic field is obtained.

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A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z

red = Greek
$\Gamma, \Delta, \Theta, \Lambda, \Xi, \Pi, \Sigma, \Phi, \Psi, \Omega,$
$\alpha, \beta, \gamma, \delta, \varepsilon, \zeta, \eta, \vartheta, \iota, \kappa, \lambda, \mu, \nu, \xi, o, \pi, \rho, \sigma, \tau, \upsilon, \varphi, \phi, \chi, \psi, \omega$

green = Script:
$\mathcal{A}, \mathcal{B}, \mathcal{C}, \mathcal{D}, \mathcal{E}, \mathcal{F}, \mathcal{G}, \mathcal{H}, \mathcal{I}, \mathcal{J}, \mathcal{K}, \mathcal{L}, \mathcal{M}, \mathcal{N}, \mathcal{O}, \mathcal{P}, \mathcal{Q}, \mathcal{R}, \mathcal{S}, \mathcal{T}, \mathcal{U}, \mathcal{V}, \mathcal{W}, \mathcal{X}, \mathcal{Y}, \mathcal{Z}$
$a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z$

blue = Gothic:
$\mathfrak{A}, \mathfrak{B}, \mathfrak{C}, \mathfrak{D}, \mathfrak{E}, \mathfrak{F}, \mathfrak{G}, \mathfrak{H}, \mathfrak{I}, \mathfrak{J}, \mathfrak{K}, \mathfrak{L}, \mathfrak{M}, \mathfrak{N}, \mathfrak{O}, \mathfrak{P}, \mathfrak{Q}, \mathfrak{R}, \mathfrak{S}, \mathfrak{T}, \mathfrak{U}, \mathfrak{V}, \mathfrak{W}, \mathfrak{X}, \mathfrak{Y}, \mathfrak{Z}$
$\mathfrak{a}, \mathfrak{b}, \mathfrak{c}, \mathfrak{d}, \mathfrak{e}, \mathfrak{f}, \mathfrak{g}, \mathfrak{h}, \mathfrak{i}, \mathfrak{j}, \mathfrak{k}, \mathfrak{l}, \mathfrak{m}, \mathfrak{n}, \mathfrak{o}, \mathfrak{p}, \mathfrak{q}, \mathfrak{r}, \mathfrak{s}, \mathfrak{t}, \mathfrak{u}, \mathfrak{v}, \mathfrak{w}, \mathfrak{x}, \mathfrak{y}, \mathfrak{z}$

violet: the small letter *l* and the capital letter *O* (to distinguish them from the numeral 1 and zero)

It will help the printer if in doubtful cases the position of subscripts and superscripts is marked in the following way:
$b_{\hat{l}}^{\hat{}}, a_{\check{v}}^{\check{l}}$.

The following symbols are frequently confused:
$\cup, \mathbf{u}, \mathrm{U}$; $o, O, 0$; $\mathrm{x}, x, X, \varkappa$; v, v, ν; $\phi, \varphi, \Phi, \varnothing$; $l, 1$; $\varepsilon, \in, \mathrm{\in}$;
also the handwritten Roman letters:
c, C; k, K; o, O; p, P; s, S; u, U; v, V; w, W; x, X; z, Z; e, l;
the symbol *a* and the indefinite article a:
Please take care to distinguish them in some way.

Notations

preferred form	instead of	preferred form	instead of
$\exp(-(x^2+y^2)/a^2)$	$e^{-\frac{x^2+y^2}{a^2}}$	$\dfrac{\cos(1/x)}{(a+b/x)^{1/2}}$	$\dfrac{\cos\frac{1}{x}}{\sqrt{a+\frac{b}{x}}}$
$7/8, (a+b)/c$	$\frac{7}{8}, \frac{a+b}{c}$	f^{-1}	$\bar{f}^{1}$

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